

## REMARKS

New claim 13 corresponds to claim 9 and has been amended to state explicitly that the radio frequency tuner is a single conversion tuner; in other words, the tuner performs a single frequency down-conversion from the frequency of the desired channel to the output intermediate frequency. Claim 13 also states explicitly that the variable divider is disposed between the mixer and the variable frequency oscillator.

The Examiner cites Tumeo as disclosing various of the features recited in the previous claims 1 and 9. First of all, applicant points out that Tumeo does not disclose a single conversion radio frequency tuner. The various elements to which the Examiner refers us in Tumeo comprise what is known as a “low noise block” or “LNB”. Such an LNB serves the function of converting the frequency of an incoming satellite broadcast signal in the microwave region to a lower frequency, in this case around 70 MHz, which can be handled by a conventional type of tuner or receiver (illustrated at 2 in Fig. 1 of Tumeo). The receiver 2 inevitably performs a further frequency conversion step to reduce the incoming radio frequency signal to a conventional intermediate frequency, which is then demodulated so as to provide audio and video signals. Thus, the system disclosed in Tumeo is inevitably a multiple conversion arrangement so that Tumeo fails to disclose a *single conversion* radio frequency tuner as required by the present invention and as recited in the new main claim 13.

The Examiner further alleges that Tumeo discloses a divider which has the function of performing frequency division on the output signal of the variable frequency oscillator. The divider is shown at 26 in Figs. 3 and 4 of Tumeo. From this and from the corresponding text at lines 5-11 and lines 32-38 of Col. 5, it is entirely clear that the divider 26 is not performing any type of

frequency division at all. Instead, the divider 26 of Tumeo is defined as an “in phase divider” whose purpose is to distribute the variable frequency oscillator signal to the mixers while ensuring that the signal supplied to the mixers are in phase with each other. This is essential for the correct operation of the LNB of Tumeo in order to provide image attenuation within the frequency converter comprising the elements 18, 21-23, 26 and 29-31. Thus, the divider 26 of Tumeo does not and cannot perform any type of frequency division but merely provides in-phase distribution of the variable oscillator signals.

The present invention is explicitly concerned with a variable divider as defined in claim 13 for dividing the frequency of a variable frequency oscillator by any one of a plurality of integers, each of which is greater than one. The divider of Tumeo is an entirely different element or device and is totally incapable of performing such a function. Tumeo therefore completely fails to disclose the variable divider and its arrangement as defined in claim 13.

Upon correct interpretation of the divider of Tumeo, it cannot therefore possibly be concluded that an in-phase divider for distributing a signal could be replaced by a frequency divider, which is an entirely different type of device performing a totally different function. The Examiner’s suggestion that it would be obvious to replace the divider of Tumeo by the frequency dividers disclosed in Sointula and Kellogg is therefore fundamentally and fatally flawed and incorrect.

In any case, the variable integer dividers disclosed in Sointula and Kellogg are arranged differently from the arrangement defined in the claim 13 and are performing a different function. Each of the citations discloses a conventional phase locked loop in which the output of a variable frequency voltage controlled oscillator is divided by a variable divider before being presented to one input of a phase detector whose other input receives a reference frequency signal.

However, the output of the variable frequency oscillator is itself used as the local oscillator signal supplied to the mixer. Thus, the divider is not and cannot be provided between the variable frequency oscillator and the mixer; it is absolutely essential for the correct operation of a phase locked loop that the divider be provided between the variable frequency oscillator and the phase detector and that the output signals of the mixer be supplied direct from the variable frequency oscillator and not via the divider. It is therefore absolutely essential and intrinsic that the divider cannot be located between the variable frequency oscillator and the mixer. Even attempting to combine the disclosure of Sointula or Kellogg with Tumeo would inevitably and essentially lead to an arrangement which failed to provide a variable divider between the variable frequency oscillator and the mixer. Thus, such combinations would completely fail to disclose this feature of the claim 13. In other words, it is absolutely and completely impossible for the prior art combinations cited by the Examiner to disclose all of the features of the claim 13, which cannot therefore be considered to be unpatentable for lack of inventive step.

Applicant points out that the combination of features defined in the claim 13 achieves a substantial technical advantage, for example, compared with arrangements using phase locked loops of the type disclosed by Sointula and Kellogg. In particular, the local oscillator frequency, i.e., the frequency of the variable frequency oscillator, lies outside the received signal band because of the frequency division by the variable divider which always performs division by an integer greater than 1. This leads to the advantages specified in the last paragraph of page 6 and the first paragraph of page 7. For example, it is no longer necessary to provide a local oscillator reject filter for preventing re-radiation from the tuner input. This in turn means that tracking filters between the

tuner input and the frequency converter are not necessary so that the inevitable signal degradation caused by such filters and the need to perform alignment are completely avoided.

Allowance of claim 13 and its dependent claims 14-22 is respectfully requested.

The Examiner is respectfully invited to telephone the undersigned to discuss the arguments submitted herein.

Petition is hereby made for a one-month extension of the period to respond to the outstanding Official Action to August 22, 2004. A check in the amount of \$110.00, as the Petition fee, is enclosed herewith. If there are any additional charges, or any overpayment, in connection with the filing of the amendment, the Commissioner is hereby authorized to charge any such deficiency, or credit any such overpayment, to Deposit Account No. 11-1145.

Wherefore, a favorable action is earnestly solicited.

Respectfully submitted,

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